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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/336,687	06/21/1999	KEN'ETSU YOKOGAWA	500.37328X00	7949

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EXAMINER
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ART UNIT	PAPER NUMBER
1763	14

DATE MAILED: 01/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application N . 09/336,687	Applicant(s) YOKOGAWA ET AL.
	Examiner Luz L. Alejandro	Art Unit 1763

-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14-34 and 36-55* is/are pending in the application.

4a) Of the above claim(s) *30,37-49 and 54* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-29,31-34,36,50-53 and 55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Prosecution Application

The request filed on 11/05/01 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/336687 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Objections

Claims 2-12, 14-29, 31-33, 36, and 50-53 are objected to because of the following informalities: at line 2, the word "Claim" should read – claim – for proper grammar. Appropriate correction is required.

Claim 52 is objected to because of the following informalities: at line 2, the word "superpose" should read – superposed – for proper grammar. Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 16, 20, 24-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 16 and 20, in claim 16-line 2, it is not clear what applicants means by the phrase "a wherein member". Clarification is required.

In claims 24 and 25, lines 4-5, the phrase "and the sample surface of Claim 1" renders the claims unclear since the phrase "Claim 1" is being repeated (see line 2 of the claims). Clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8, 10-12, 14-29, 31-34, 36, 50-53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., U.S. Patent 5,891,252 in view of Collins et al., U.S. Pat nt 6,068,784 and Singh et al., U.S. Patent 6,042,687.

Yokogawa et al. shows the invention as claimed including a plasma processing system for use with a surface processing apparatus in which a vacuum chamber 101 includes a vacuum generating means (see figure 1 and col. 4, lines 35-40); source material gas supply means 120 having the claimed characteristic of claim 12; sample setting means 111; high-frequency power applying means; the source material is transformed into plasma to achieve surface processing of the sample 110; means for generating the plasma including electromagnetic wave supply means 104; magnetic field generating means 102; means 112 for making radicals incident to a surface of the sample; and means for reducing variation in time of the radicals incident to the sample; wherein the apparatus introduces electromagnetic field from a planar plate 107, the planar plate being disposed in parallel with the sample into the vacuum chamber (see figure 1), and is set to be separated from the sample by the claimed distance (see col. 7, lines 53-59).

Yokogawa et al. does not expressly disclose a main control means, but Collins et al. disclose an apparatus in which a controller 86 is used to automate the plasma apparatus. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Yokogawa et al. as to further comprise the claimed control system as to precisely controlling the desired apparatus and/or process parameters.

Yokogawa et al. and Collins et al. do not expressly disclose the claimed ring-shaped member. Singh et al. discloses a ring-shaped member 172 disposed in a periphery of the substrate 120 (see the abstract and fig. 3 and col. 4, lines 39-52). In

view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the ring-shaped member in the apparatus of the Yokogawa et al. and the Collins et al. references to improve the plasma uniformity.

With respect to the diameter of the planar plate, the Yokogawa et al. reference in col. 4, lines 49-54, discloses that it varies depending on the resonance mode of the electromagnetic wave. In col. 4, lines 41-43, the reference disclosed that the electromagnetic wave to generate the plasma has a frequency ranging from 300-500 MHz; in col. 5, lines 5-64, the reference discloses that the electromagnetic field generated satisfy the ECR condition, the use of means 116 for generating electromagnetic wave of 300 kHz frequency onto the planar plate, the use of means 114 for controlling the temperature of the planar plate, and the claimed surface material of the planar plate of claims 10 and 26-27. With respect to claim 22, the limitations are disclosed in figure 2 and it description. With respect to the electromagnetic wave characteristics of claims 21 and 32, it would have been obvious to one having ordinary skill in the art at the time the invention was made that such characteristics can be achieve by controlling the parameters governing the electromagnetic wave and ECR conditions.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., U.S. Patent 5,891,252 in view of Collins et al., U.S. Patent 6,068,784 and Singh et al., U.S. Patent 6,042,687, as applied to claims 1-8, 10-12, 14-29, 31-34, 36, 50-53 and 55 above, and further in view of Gupta et al., U.S. Patent 5,902,494.

Yokogawa et al., Collins et al., and Singh et al. are applied as above but do not expressly disclose a planar plate including a plurality of holes through which the material gas is supplied. Gupta et al. discloses a plasma apparatus in which the planar plate 11, to which mixed frequency can be supplied, is a gas manifold through which the gas is introduced to the processing chamber (see figure 1 and col. 4, lines 29-34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Yokowaga et al., Collins et al., and the Singh et al. references by introducing the gas material through holes in the planar plate since such gas inlet configuration is well known and used in the art for uniformly dispersing the gas material to the chamber.

Claims 1-8, 10-12, 14-29, 31-34, 36, 50-53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., JP 9-321031 (machine translation) in view of Collins et al., U.S. Patent 6,068,784 and Singh et al., U.S. Patent 6,042,687.

Yokogawa et al. shows the invention as claimed including a plasma processing system for use with a surface processing apparatus in which a vacuum chamber 101 includes a vacuum generating means (see figure 1 and paragraph 0017); source material gas supply means 116 having the claimed characteristic of claim 12; sample setting means 111; high-frequency power applying means; the source material is transformed into plasma to achieve surface processing of the sample 110; means for generating the plasma including electromagnetic wave supply means 104; magnetic

field generating means 102; means 112 for making radicals incident to a surface of the sample; and means for reducing variation in time of the radicals incident to the sample; wherein the apparatus introduces electromagnetic field from a planar plate 107, the planar plate being disposed in parallel with the sample into the vacuum chamber (see figure 1), and is set to be separated from the sample by the claimed distance (see paragraph 0021).

Yokogawa et al. does not expressly disclose a main control means, but Collins et al. disclose an apparatus in which a controller 86 is used to automate the plasma apparatus. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Yokogawa et al. as to further comprise the claimed control system as to precisely controlling the desired apparatus and/or process parameters.

Yokogawa et al. and Collins et al. do not expressly disclose the claimed ring-shaped member. Singh et al. discloses a ring-shaped member 172 disposed in a periphery of the substrate 120 (see the abstract and fig. 3 and col. 4, lines 39-52). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the ring-shaped member in the apparatus of the Yokogawa et al. and the Collins et al. references to improve the plasma uniformity.

With respect to the diameter of the planar plate, the Yokogawa et al. reference in paragraph 0017, discloses that it varies depending on the resonance mode of the electromagnetic wave. Also, in paragraph 0017, the reference disclosed that the electromagnetic wave to generate the plasma has a frequency ranging from 300-500

MHz and that the electromagnetic field generated satisfy the ECR condition, the use of means 116 for generating electromagnetic wave of 300 kHz frequency onto the planar plate, the use of means 114 for controlling the temperature of the planar plate, and the claimed surface material of the planar plate of claims 10 and 26-27. With respect to claim 22, the limitations are disclosed in figure 2 and it description. With respect to the electromagnetic wave characteristics of claims 21 and 32, it would have been obvious to one having ordinary skill in the art at the time the invention was made that such characteristics can be achieve by controlling the parameters governing the electromagnetic wave and ECR conditions.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokogawa et al., JP 9-321031 (machine translation) in view of Collins et al., U.S. Patent 6,068,784 and Singh et al., U.S. Patent 6,042,687, as applied to claims 1-8, 10-12, 14-29, 31-34, 36, 50-53 and 55 above, and further in view of Gupta et al., U.S. Patent 5,902,494.

Yokogawa et al., Collins et al., and Singh et al. are applied as above but do not expressly disclose a planar plate including a plurality of holes through which the material gas is supplied. Gupta et al. discloses a plasma apparatus in which the planar plate 11, to which mixed frequency can be supplied, is a gas manifold through which the gas is introduced to the processing chamber (see figure 1 and col. 4, lines 29-34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Yokowaga et al.,

Collins et al., and the Singh et al. references by introducing the gas material through holes in the planar plate since such gas inlet configuration is well known and used in the art for uniformly dispersing the gas material to the chamber.

Response to Arguments

Applicant's arguments filed 11/05/01 have been fully considered but they are not persuasive. Applicants argue that due to the filing of the CPA, the Yokogawa et al., U.S. Patent 5,891,252, does not qualifies as prior art. However, it has been noted that the required statement stating that the patent and the application are commonly assigned is not proper since it is not complete. In specific, the statement should include that the application and the patent **were commonly assigned at the time the invention was made**. Therefore, the rejections under 35 U.S.C. 103 having the Yokogawa et al. U.S. Patent 5,891,252 reference, are proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers

for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Luz L. Alejandro
Patent Examiner
Art Unit 1763

January 28, 2002